

NASA QSSE Project Abstract

Zinc-metal batteries are a promising lithium-ion alternative with dendrites, water decomposition, and freezing. EIS and cyclic voltammetry to compare two quasi-solid-state electrolytes (QSSE), ZnCl_2 and $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$, from 10°C to -10°C . The ZnCl_2 formulation maintains stable performance, while ZnSO_4 fails at low temperatures ($>500 \text{ k}\Omega$ at 0°C), establishing ZnCl_2 -based QSSE as superior for cold-operating zinc batteries.